WHAT IS CLAIMED:

1. A purified and isolated polynucleotide selected from the group consisting of:

(a) a polynucleotide encoding a polypeptide having an amino acid sequence of SEQ ID NO: 2.

(b) a polynucleotide which is complementary to the polynucleotide of (a),

(c) a polynucleotide representing a naturally occurring mutant or polymorphic form of (a), and

(d) a polynucleotide comprising at least 25 nucleotides of the polynucleotide of (a), (b) or (c), said 25 nucleotides being specific for *murD* gene of *Pseudomonas aeruginosa*.

2. The polynucleotide of claim 1 wherein the polynucleotide comprises nucleotides selected from the group consisting of natural, non-natural and modified nucleotides.

3. The polynucleotide of claim 1 wherein the internucleotide linkages are selected from the group consisting of natural and non-natural linkages.

4. The polynucleotide of claim 1 comprising the nucleotide sequence of SEQ ID NO:1.

5. A polynucleotide that is an expression vector comprising a polynucleotide of claim 1.

6. A host cell comprising the expression vector of claim 5.

7. A process for expressing a MurD protein of *Pseudomonas aeruginosa* in a recombinant host cell, comprising:

(a) transforming a suitable host cell with an expression vector of claim 5; and,

(b) culturing the host cell of step (a) in conditions under which [illegible] the MurD protein from said expression vector

8. A purified and isolated polypeptide having an amino acid sequence selected from the group consisting of

(a) a polypeptide having an amino acid sequence of SEQ ID NO:2,

(b) a polypeptide that is a naturally occurring mutant or polymorphic form of (a).

9. A method of determining whether a candidate compound is an inhibitor of a *Pseudomonas aeruginosa* MurD polypeptide comprising:

(a) providing at least one host cell harboring an expression vector that includes a polynucleotide selected from the group consisting of:

(i) a polynucleotide encoding a polypeptide having an amino acid sequence of SEQ ID NO: 2.

(ii) a polynucleotide which is complementary to the polynucleotide of (i),

(iii) a polynucleotide representing a naturally occurring mutant or polymorphic form of (i), and

(b) contacting at least one of said cells with the candidate to permit the interaction of the candidate with the MurD polypeptide, and

(c) determining whether the candidate is an inhibitor of the MurD polypeptide by ascertaining the relative activity of the polypeptide in the presence of the candidate.

10. The method of claim 9 wherein the polynucleotide has the nucleotide sequence of SEQ ID NO:1.

11. The method of claim 9 wherein in step (c) the relative activity is determined by comparing a measurement of MurD polypeptide activity of at least one cell before step (b) to a measurement of MurD polypeptide activity of at least one cell after step (b).

12. A compound that is an inhibitor of a polypeptide having an amino acid sequence selected from the group consisting of

(a) a polypeptide having an amino acid sequence of SEQ ID NO:2,

(b) a polypeptide that is a naturally occurring mutant or

13. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and an inhibitor of a polypeptide having an amino acid sequence selected from the group consisting of

(a) a polypeptide having an amino acid sequence of SEQ ID NO:2,

(b) a polypeptide that is a naturally occurring mutant or polymorphic form of (a).

14. A method of treatment of a patient in need of prophylactic or therapeutic treatment for a bacterial infection comprising administering to the patient an effective amount of an inhibitor of a polypeptide having an amino acid sequence selected from the group consisting of

(a) a polypeptide having an amino acid sequence of SEQ ID NO:2,

(b) a polypeptide representing a naturally occurring mutant or polymorphic form of (a).